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| EXAMINER | |
|---|---|
| LOHN, JOSHUA A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2114 | |

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/631,336 | KONG ET AL. | |
| | Examiner | Art Unit | |
| | Joshua A. Lohn | 2114 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4 and 8-24* is/are rejected.

7)☒ Claim(s) *2,3,6,7,25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 9, 11, 12, 17-19, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Mendenhall et al., United State Patent number 5,812,760, published September 22, 1998.

As per claim 1, Mendenhall discloses a fault tolerant graphics controller comprising: an error code generator that receives graphics command codes, the error code generator configured to generate an error code for each graphics command code received (Mendenhall, col. 6, lines 11-14, where the bitstream includes the graphic command codes and the error codes are the flag indicators); a frame buffer for storing graphics data and graphics commands, including the error codes generated by the error code generator (Mendenhall, col. 8, lines 53-57, where the data is all transmitted on to the video frame buffer); an error code decoder connected between the frame buffer and the graphics controller and configured to determine from a command code and its associated error code whether or not there is an error in the command code and to provide an indication thereof (Mendenhall, col. 8, lines 57-61, where the data errors are decoded in transit and indicated when detected); and a graphics controller for executing the graphics command codes to display the graphics data (Mendenhall, col. 8, lines 53-55, where the purpose of the video buffer is to display the bitstream info as graphics).

As per claim 4, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, wherein the error code generator receives data associated with graphics commands and is further configured to generate an error code for graphics data received (Mendenhall, col. 6, lines 11-14, where the bitstream info checked would include commands and graphics data as well); and wherein the error code decoder is configured to determine from graphics data and its associated error code whether or not there is an error in the graphics data and to provide an indication thereof (Mendenhall, col. 8, lines 57-61).

As per claim 9, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, further comprising an interrupt and status controller, connected to the error code decoder, the interrupt and status controller configured to generate an interrupt or error status to a computer system hosting the graphics controller in response to the error indication from the error code decoder (Mendenhall, col. 6, lines 21-28).

As per claim 11, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, further comprising a flush-command controller connected to the error code decoder, the flush-command controller configured to flush command codes with errors from the graphics controller in response to the error indication (Mendenhall, col. 8, lines 57-61, where the byte removal acts as a flush command to remove erroneous codes).

As per claim 12, Mendenhall discloses a fault tolerant graphics controller as recited in claim 11, wherein the flush-command controller is configured to flush data associated with any

erroneous command that is flushed (Mendenhall, col. 8, lines 57-61, where all erroneous bytes are flushed).

As per claim 17, Mendenhall discloses a method for processing graphics commands, comprising: receiving a graphics command code; generating an error code for the graphics command code (Mendenhall, col. 6, lines 11-14, where the bitstream includes the graphic command codes and the error codes are the flag indicators); storing the graphics command code and its associated error code in a frame buffer configured to store graphics command codes and graphics data (Mendenhall, col. 8, lines 53-57, where the data is all sent on to the video frame buffer); accessing the frame buffer for the graphics command code and obtaining its associated error code; determining from the graphics command code and its associated error code whether there is an error in the graphics command code and providing an indication thereof (Mendenhall, col. 8, lines 57-61, where data errors are decoded and an indication is provided in the flag values); executing the graphics commands to display the graphics data (Mendenhall, col. 8, lines 53-55, where the purpose of the video buffer is to display the bitstream information as graphics data).

As per claim 18, Mendenhall further discloses a method for processing graphics commands, as recited in claim 17, further comprising: receiving graphics data; generating an error code for graphics data (Mendenhall, col. 6, lines 11-14, where all bitstream info is checked, which would include both the commands and the graphics data); storing the graphics data in the frame buffer; accessing the frame buffer for the graphics data and obtaining its associated error code (Mendenhall, col. 8, lines 53-57, where the data is eventually sent to the frame buffer where

it can be further accessed); and determining from the graphics data and its associated error code whether there is an error in the graphics data and providing an indication thereof (Mendenhall, col. 8, lines 57-61, where the data errors are determined and indications are provided in the flags).

As per claim 19, Mendenhall further discloses a method for processing graphics commands, as recited in claim 17, further comprising generating an interrupt or error status in response to an error indication (Mendenhall, col.; 6, lines 21-28).

As per claim 21, Mendenhall further discloses a method for processing graphics commands, as recited in claim 17, further comprising preventing the execution of command codes in response to an error indication (Mendenhall, col. 8, lines 57-61, where the byte removal acts to prevent execution of the command).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 10, 13, 14, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall in view of Brown et al., United States Patent number 6,675,345, file May 12, 2000.

As per claim 8, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, however Mendenhall fails to disclose the error code detector determining that an error is correctable, and further correcting the error.

Brown discloses determining that a detected error in the command code is correctable and the decoder is further configured to correct the error in the command code (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide

the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

As per claim 10, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, further comprising an interrupt and status controller connected to the error code decoder, the interrupt and status controller configured to generate an interrupt or error status to a computer hosting the graphics controller in response to an error status (Mendenhall, col. 6, lines 21-28). Mendenhall fails to disclose the interrupt is only utilized in response to an error indication that the error is uncorrectable.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

As per claim 13, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1, further comprising a flush-command controller connected to the error code decoder, the flush-command controller configured to flush command codes with errors from the graphics controller in response to an error indication (Mendenhall, col. 8, lines 57-61, where the byte removal acts as a flush command to remove erroneous codes). Mendenhall fails to disclose that the flush is only utilized in response to an error indication that the error is uncorrectable.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

As per claim 14, Mendenhall and Brown further disclose a fault tolerant graphics controller as recited in claim 13, wherein the flush-command controller is configured to flush data associated with any erroneous command that is flushed (Mendenhall, col. 8, lines 57-61, where all erroneous bytes are flushed).

As per claim 20, Mendenhall discloses a method for processing graphics commands as recited in claim 17, further comprising generating an interrupt or error status in response to an error indication (Mendenhall, col. 6, lines 21-28). Mendenhall fails to disclose the interrupt is only utilized in response to an error indication that the error is uncorrectable.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

As per claim 22, Mendenhall discloses a method for processing graphics commands, as recited in claim 17, further preventing the execution of command codes in response to an error indication when (Mendenhall, col. 8, lines 57-61, where the byte removal acts to prevent the execution of the command). Mendenhall fails to disclose that the prevention is only utilized in response to an error indication that the error is uncorrectable.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

Claims 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall in view of Abe, Japanese Patent number 4-287243, English language abstract, published October 12, 1992.

As per claim 15, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1 that includes a buffer containing multiple data entries for sequential graphics commands (Mendenhall, col. 4, lines 3-7). However Mendenhall fails to disclose storing commands bordering the error detection.

Abe discloses the use of a store-command controller connected to the error code decoder, the store-command controller configured to store command codes before and after the command code determined to have an error in response to the error indication (Abe, CONSTITUTION, where the commands before are recorded and the status of the variables in memory are recorded).

It would have been obvious to one skilled in the art at the time of the invention to use the error logging of Abe in the invention of Mendenhall. This would have been obvious because both Mendenhall and Abe deal with processing errors in data streams (Mendenhall, col. 1, lines 5-8 and Abe, CONSTITUTION). Mendenhall further discloses having programmable error handling (Mendenhall, col. 2, lines 28-30), which could include systems like the logging of Abe. The logging of Abe provides the obvious benefit of increasing reliability by analyzing past command information, as well as current variable information, where the variable information would include any information stored in the buffer of Mendenhall, including subsequent command information.

As per claim 23, Mendenhall discloses a method for processing graphics commands, as recited in claim 17 that includes a buffer containing multiple data entries for sequential graphics commands (Mendenhall, col. 4, lines 3-7). However Mendenhall fails to disclose storing commands bordering the error detection.

Abe discloses the use of a store-command controller connected to the error code decoder, the store-command controller configured to store command codes before and after the command code determined to have an error in response to the error indication (Abe, CONSTITUTION, where the commands before are recorded and the status of the variables in memory are recorded).

It would have been obvious to one skilled in the art at the time of the invention to use the error logging of Abe in the invention of Mendenhall. This would have been obvious because both Mendenhall and Abe deal with processing errors in data streams (Mendenhall, col. 1, lines 5-8 and Abe, CONSTITUTION). Mendenhall further discloses having programmable error handling (Mendenhall, col. 2, lines 28-30), which could include systems like the logging of Abe. The logging of Abe provides the obvious benefit of increasing reliability by analyzing past command information, as well as current variable information, where the variable information would include any information stored in the buffer of Mendenhall, including subsequent command information.

Claims 16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall in view of Abe, in further view of Brown.

As per claim 16, Mendenhall discloses a fault tolerant graphics controller as recited in claim 1 that includes a buffer containing multiple data entries for sequential graphics commands (Mendenhall, col. 4, lines 3-7). However Mendenhall fails to disclose storing commands bordering the error detection and detecting the error is uncorrectable before handling.

Abe discloses the use of a store-command controller connected to the error code decoder, the store-command controller configured to store command codes before and after the command code determined to have an error in response to the error indication (Abe, CONSTITUTION, where the commands before are recorded and the status of the variables in memory are recorded).

It would have been obvious to one skilled in the art at the time of the invention to use the error logging of Abe in the invention of Mendenhall. This would have been obvious because both Mendenhall and Abe deal with processing errors in data streams (Mendenhall, col. 1, lines 5-8 and Abe, CONSTITUTION). Mendenhall further discloses having programmable error handling (Mendenhall, col. 2, lines 28-30), which could include systems like the logging of Abe. The logging of Abe provides the obvious benefit of increasing reliability by analyzing past command information, as well as current variable information, where the variable information would include any information stored in the buffer of Mendenhall, including subsequent command information. Mendenhall and Abe fail to disclose detecting that the error is uncorrectable before executing the error handling.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

As per claim 24, Mendenhall discloses a method for processing graphics commands, as recited in claim 17 that includes a buffer containing multiple data entries for sequential graphics commands (Mendenhall, col. 4, lines 3-7). However Mendenhall fails to disclose storing commands bordering the error detection and detecting the error is uncorrectable before handling.

Abe discloses the use of a store-command controller connected to the error code decoder, the store-command controller configured to store command codes before and after the command code determined to have an error in response to the error indication (Abe, CONSTITUTION, where the commands before are recorded and the status of the variables in memory are recorded).

It would have been obvious to one skilled in the art at the time of the invention to use the error logging of Abe in the invention of Mendenhall. This would have been obvious because both Mendenhall and Abe deal with processing errors in data streams (Mendenhall, col. 1, lines 5-8 and Abe, CONSTITUTION). Mendenhall further discloses having programmable error handling (Mendenhall, col. 2, lines 28-30), which could include systems like the logging of Abe. The logging of Abe provides the obvious benefit of increasing reliability by analyzing past command information, as well as current variable information, where the variable information would include any information stored in the buffer of Mendenhall, including subsequent command information. Mendenhall and Abe fail to disclose detecting that the error is uncorrectable before executing the error handling.

Brown discloses determining if an error is correctable, and forwarding an error status when an error is uncorrectable (Brown, col. 2, lines 50-57).

It would have been obvious to one skilled in the art at the time of the invention to include the correction capabilities of Brown in the system of Mendenhall. This would have been obvious because both inventions deal with processing errors in graphics streams (Mendenhall, col. 1, lines 5-8 and Brown, col. 1, lines 6-11). Mendenhall further discloses a desire to allow for programmable error handling (Mendenhall, col. 2, lines 28-30), such as that which Brown supplies in an error processing system that includes correctable errors (Brown, col. 2, lines 50-56). It would have been obvious to one skilled in the art at the time of the invention to provide the benefits of the error correction of Brown, while still utilizing the more extreme measures of Mendenhall when an error is found to be uncorrectable and the error status remains active.

### *Allowable Subject Matter*

Claims 2, 3, 5, 6, 7, 25, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is provided on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua A. Lohn whose telephone number is (571) 272-3661. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAL

SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER